

What is claimed is:

1. An oil pressure control device for changing the operating range of a vehicle transmission, the operating range including at least a drive range which advances the vehicle, a reverse range which reverses the vehicle and a stop range which stops the vehicle, wherein:

the transmission has a forward/reverse change-over part which is provided with a forward clutch which transmits a drive force generated by an engine to the transmission as a drive force which advances the vehicle, and a reverse clutch which transmits a drive force generated by the engine to the transmission as a drive force which reverses the vehicle, wherein only the forward clutch is engaged by oil pressure in the drive range, only the reverse clutch is engaged by oil pressure in the reverse range, and both the forward clutch and reverse clutch are released in the stop range, and

a speed change part connected to the forward/reverse change-over part, the oil pressure control device comprising:

a clutch pressure adjusting device which adjusts the oil pressure from a pump, and engages or releases the forward clutch and reverse clutch by supplying the adjusted oil pressure to one of the forward clutch and reverse clutch,

a sensor which detects an operating range selected by a driver of the vehicle, and

a controller which controls the clutch pressure adjusting device based on a signal from the sensor,

wherein the controller functions to:

control the clutch pressure adjusting device to supply an initial oil pressure to the forward clutch and subsequently decrease the supplied oil pressure from the initial oil pressure to a predetermined oil pressure, when the drive range is selected after the stop range has been selected from the reverse range, and when the time for which the stop range has been selected is longer than a time required for the oil pressure supplied to the reverse clutch to decrease to zero;

control the clutch pressure adjusting device to increase the supplied oil pressure at a small increase rate from the predetermined oil pressure during a predetermined time period; and

after the predetermined time period has elapsed, control the clutch pressure adjusting device to increase the supplied oil pressure at a large increase rate.

2. The oil pressure control device as defined in Claim 1, wherein the predetermined time period is a period from when the oil pressure is decreased to when a backlash of a power train of the vehicle disappears due to forward rotation of the power train of the vehicle.

3. The oil pressure control device as defined in Claim 2, wherein the predetermined time period depends on the size of the power train.

4. The oil pressure control device as defined in Claim 1, wherein the forward clutch comprises a clutch piston displaced by oil pressure, and a piston spring which pushes the clutch piston in an opposite direction to a force of the oil pressure, and

the oil pressure supplied to the forward clutch during the predetermined time period is a slightly higher pressure than the pressure applied to the clutch piston from the piston spring, and is a lower pressure than the initial pressure.

5. An oil pressure control device for changing the operating range of a vehicle transmission, the operating range including at least a drive range which advances the vehicle, a reverse range which reverses the vehicle and a stop range which stops the vehicle, wherein:

the transmission has a forward/reverse change-over part which is provided with a forward clutch which transmits a drive force generated by an engine to the transmission as a drive force which advances the vehicle, and a reverse clutch which transmits a drive force generated by the engine to the

transmission as a drive force which reverses the vehicle, wherein only the forward clutch is engaged by oil pressure in the drive range, only the reverse clutch is engaged by oil pressure in the reverse range, and both the forward clutch and reverse clutch are released in the stop range, and

a speed change part connected to the forward/reverse change-over part, the oil pressure control device comprising:

a clutch pressure adjusting device which adjusts the oil pressure from a pump, and engages or releases the forward clutch and reverse clutch by supplying the adjusted oil pressure to one of the forward clutch and reverse clutch,

a sensor which detects an operating range selected by a driver of the vehicle, and

a controller which controls the clutch pressure adjusting device based on a signal from the sensor,

wherein the controller functions to:

control the pressure adjusting device to supply an initial oil pressure to the reverse clutch and subsequently decrease the supplied oil pressure from the initial oil pressure to a predetermined oil pressure, when the reverse range is selected after the stop range has been selected from the drive range, and when the time for which the stop range has been selected is longer than a time required for the oil pressure supplied to the forward clutch to decrease to zero;

control the clutch pressure adjusting device to increase the supplied oil pressure at a small increase rate from the predetermined oil pressure during a predetermined time period; and

after the predetermined time period has elapsed, control the clutch pressure adjusting device to increase the supplied oil pressure at a large increase rate.

6. The oil pressure control device as defined in Claim 5, wherein the predetermined time period is a period from when the oil pressure is decreased to when a backlash of a power train of the vehicle disappears due

to reverse rotation of the power train of the vehicle.

7. The oil pressure control device as defined in Claim 6, wherein the predetermined time period depends on the size of the power train.

8. The oil pressure control device as defined in Claim 5, wherein the reverse clutch comprises a clutch piston displaced by oil pressure, and a piston spring which pushes the clutch piston in an opposite direction to a force of the oil pressure, and

the oil pressure supplied to the reverse clutch during the predetermined time period is a slightly higher pressure than the pressure applied to the clutch piston from the piston spring, and is a lower pressure than the initial pressure.

9. An oil pressure control device for changing the operating range of a vehicle transmission, the operating range including at least a drive range which advances the vehicle, a reverse range which reverses the vehicle and a stop range which stops the vehicle, wherein:

the transmission has a forward/reverse change-over part which is provided with a forward clutch which transmits a drive force generated by an engine to the transmission as a drive force which advances the vehicle, and a reverse clutch which transmits a drive force generated by the engine to the transmission as a drive force which reverses the vehicle, wherein only the forward clutch is engaged by oil pressure in the drive range, only the reverse clutch is engaged by oil pressure in the reverse range, and both the forward clutch and reverse clutch are released in the stop range, and

a speed change part connected to the forward/reverse change-over part, the oil pressure control device comprising:

a clutch pressure adjusting device which adjusts the oil pressure from a pump, and engages or releases the forward clutch and reverse clutch by supplying the adjusted oil pressure to one of the forward clutch and reverse clutch,

a sensor which detects an operating range selected by a driver of the vehicle, and

a controller which controls the clutch pressure adjusting device based on a signal from the sensor,

wherein the controller functions to:

control the clutch pressure adjusting device to supply an initial oil pressure to the forward clutch and subsequently decrease the supplied oil pressure from the initial oil pressure to a predetermined oil pressure, when the drive range is selected after the stop range has been selected from the reverse range, and when the time for which the stop range has been selected is shorter than a time required for the oil pressure supplied to the reverse clutch to decrease to zero;

control the clutch pressure adjusting device to increase the supplied oil pressure at a small increase rate from the predetermined oil pressure during a predetermined time period; and

after the predetermined time period has elapsed, control the clutch pressure adjusting device to increase the supplied oil pressure at a large increase rate.

10. The oil pressure control device as defined in Claim 9, wherein the predetermined time period is a period from when the oil pressure is decreased to when a backlash of a power train of the vehicle disappears due to forward rotation of the power train of the vehicle, wherein the oil pressure supplied to the reverse clutch has decreased to zero during the predetermined time period.

11. The oil pressure control device as defined in Claim 10, wherein the predetermined time period depends on the size of the power train.

12. The oil pressure control device as defined in Claim 9, wherein the forward clutch comprises a clutch piston displaced by oil pressure, and a piston spring which pushes the clutch piston in an opposite direction to a

force of the oil pressure, and

the oil pressure supplied to the forward clutch during the predetermined time period is a slightly higher pressure than the pressure applied to the clutch piston from the piston spring, and is a lower pressure than the initial pressure.

13. An oil pressure control device for changing the operating range of a vehicle transmission, the operating range including at least a drive range which advances the vehicle, a reverse range which reverses the vehicle and a stop range which stops the vehicle, wherein:

the transmission has a forward/reverse change-over part which is provided with a forward clutch which transmits a drive force generated by an engine to the transmission as a drive force which advances the vehicle, and a reverse clutch which transmits a drive force generated by the engine to the transmission as a drive force which reverses the vehicle, wherein only the forward clutch is engaged by oil pressure in the drive range, only the reverse clutch is engaged by oil pressure in the reverse range, and both the forward clutch and reverse clutch are released in the stop range, and

a speed change part connected to the forward/reverse change-over part, the oil pressure control device comprising:

a clutch pressure adjusting device which adjusts the oil pressure from a pump, and engages or releases the forward clutch and reverse clutch by supplying the adjusted oil pressure to one of the forward clutch and reverse clutch,

a sensor which detects an operating range selected by a driver of the vehicle, and

a controller which controls the clutch pressure adjusting device based on a signal from the sensor,

wherein the controller functions to:

control the pressure adjusting device to supply an initial oil pressure to the reverse clutch and subsequently decrease the supplied oil pressure from the initial oil pressure to a predetermined oil pressure, when the reverse

range is selected after the stop range has been selected from the drive range, and when the time for which the stop range has been selected is shorter than a time required for the oil pressure supplied to the forward clutch to decrease to zero;

control the clutch pressure adjusting device to increase the supplied oil pressure at a small increase rate from the predetermined oil pressure during a predetermined time period; and

after the predetermined time period has elapsed, control the clutch pressure adjusting device to increase the supplied oil pressure at a large increase rate.

14. The oil pressure control device as defined in Claim 13, wherein the predetermined time period is a period from when the oil pressure is decreased to when a backlash of a power train of the vehicle disappears due to reverse rotation of the power train of the vehicle, wherein the oil pressure supplied to the forward clutch has decreased to zero during the predetermined time period.

15. The oil pressure control device as defined in Claim 14, wherein the predetermined time period depends on the size of the power train.

16. The oil pressure control device as defined in Claim 12, wherein the reverse clutch comprises a clutch piston displaced by oil pressure, and a piston spring which pushes the clutch piston in an opposite direction to a force of the oil pressure, and

the oil pressure supplied to the reverse clutch during the predetermined time period is a slightly higher pressure than the pressure applied to the clutch piston from the piston spring, and is a lower pressure than the initial pressure.

17. An oil pressure control device for changing the operating range of a vehicle transmission, the operating range including at least a drive range

which advances the vehicle, a reverse range which reverses the vehicle and a stop range which stops the vehicle, wherein:

the transmission has a forward/reverse change-over part which is provided with a forward clutch which transmits a drive force generated by an engine to the transmission as a drive force which advances the vehicle, and a reverse clutch which transmits a drive force generated by the engine to the transmission as a drive force which reverses the vehicle, wherein only the forward clutch is engaged by oil pressure in the drive range, only the reverse clutch is engaged by oil pressure in the reverse range, and both the forward clutch and reverse clutch are released in the stop range, and

a speed change part connected to the forward/reverse change-over part, the oil pressure control device comprising:

a clutch pressure adjusting means for adjusting the oil pressure from a pump, and engages or releases the forward clutch and reverse clutch by supplying the adjusted oil pressure to one of the forward clutch and reverse clutch,

a sensor means for detecting an operating range selected by a driver of the vehicle,

a control means for controlling the clutch pressure adjusting means to supply an initial oil pressure to the forward clutch and subsequently decrease the supplied oil pressure from the initial oil pressure to a predetermined oil pressure, when the drive range is selected after the stop range has been selected from the reverse range;

a control means for controlling the clutch pressure adjusting means to increase the supplied oil pressure at a small increase rate from the predetermined oil pressure during a predetermined time period; and

a control means for controlling the clutch pressure adjusting means to increase the supplied oil pressure at a large increase rate after the predetermined time period has elapsed.

18. An oil pressure control device for changing the operating range of a vehicle transmission, the operating range including at least a drive range



which advances the vehicle, a reverse range which reverses the vehicle and a stop range which stops the vehicle, wherein:

the transmission has a forward/reverse change-over part which is provided with a forward clutch which transmits a drive force generated by an engine to the transmission as a drive force which advances the vehicle, and a reverse clutch which transmits a drive force generated by the engine to the transmission as a drive force which reverses the vehicle, wherein only the forward clutch is engaged by oil pressure in the drive range, only the reverse clutch is engaged by oil pressure in the reverse range, and both the forward clutch and reverse clutch are released in the stop range, and

a speed change part connected to the forward/reverse change-over part, the oil pressure control device comprising:

a clutch pressure adjusting means for adjusting the oil pressure from a pump, and engages or releases the forward clutch and reverse clutch by supplying the adjusted oil pressure to one of the forward clutch and reverse clutch,

a sensor means for detecting an operating range selected by a driver of the vehicle,

a control means for controlling the pressure adjusting means to supply an initial oil pressure to the reverse clutch and subsequently decrease the supplied oil pressure from the initial oil pressure to a predetermined oil pressure, when the reverse range is selected after the stop range has been selected from the drive range;

a control means for controlling the clutch pressure adjusting means to increase the supplied oil pressure at a small increase rate from the predetermined oil pressure during a predetermined time period; and

a control means for controlling the clutch pressure adjusting means to increase the supplied oil pressure at a large increase rate after the predetermined time period has elapsed.